# Casey Dedrick-Alden

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| Profile  |

Junior Embedded Test Engineer with 2 years of professional experience and a Bachelor’s Degree in Computer Engineering from NC State. Strong in embedded systems testing and Python programming in Linux environments. Strong believer that every day there are new opportunities to learn new skills and grow. Always striving to improve myself and my skills whenever possible.

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| Technical Skills |

**Programming Languages:**

* C - (4yrs) embedded systems control, sensors, LCD writing, RTOS, GPS, Wi-Fi
* Python – (1yr) Raspberry Pi, web scanning, motor control, sensors, Wi-Fi, NFC read and write
* C++ - (1yr) some embedded, very simple UI’s
* Java - (1yr) client-server communications, simple games, UI, calculator with solve-for-x function

**Hardware:**

* Low-power PCB design
* Soldering – small component surface mount and cables
* Component troubleshooting using standard lab equipment (function generators, logic analyzers, oscilloscopes, high frequency oscilloscopes, multimeters, power supplies)

**Experience with Linux/UNIX computing environment:**

* Ubuntu, Kubuntu, Arch, Redhat, Puppy, Kali, Backtrack, Raspbian

**Network Tools:**

* Nmap and Wireshark

**Debuggers/IDE’s:**

* Spyder, IDLE, Eclipse (Oxygen, Neon), PyCharm, IAR, Code Composer Studio, Geany

**AutoCAD:**

* **Electrical:** KiCAD, DesignSpark, Altium Circuit Designer, CircuitMaker, Eagle
	+ Low-power PCB for Honeywell, prototype for home projects, tracking traces on large projects
* **Mechanical/3D:** Fusion360, Sketchup
	+ Mechanical engine/transmission component design, simple workbenches and shelving design

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| Experience |

**Cisco (Contract) Jan 2019 – Oct 2019**

**QA Test Engineer**

Receiving prototype hardware from manufacturers before updating hardware, firmware, and software. Then running automated and manual tests in a Linux environment and reading through log files for issues for different teams to fix or be aware of. Also putting probes on the PCB to find and log quality of signals that might require hardware changes in future manufacturing or troubleshooting of failed devices.

* Reading large (20+) layer schematics
* Testing network equipment
* Reading large PCB files
* Electrical troubleshooting
* Hardware/Software bug tracking and reporting
* Linux virtual machines
* Prototype testing
* High frequency oscilloscope
* FPGA flashing and testing
* Generating and debugging log files
* Logging known issues and solutions
* Writing update procedure instructions
* Prototype asset management and tracking

**Honeywell/Elster – Raleigh, NC (Contract) Nov 2017 - Feb 2018**

**JR Firmware Test Engineer**

* Manual and automated testing of Digital Analog Converters, USB equipment, Power Supplies, Optical to USB communication devices
* Embedded software troubleshooting
* Visual Basic 6 (memory table read, write, calculations)
* Schematic proofreading
* PCB design and verification
* Soldering (PCB, cables, and board modification)
* BOM generation and discontinued part replacement
* Design document upkeep and generation
* Building test fixtures
* Bug tracking
* Kanban and Scrum Agile processes, ticket system (Rally)
* SVN version control

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| Education |

**Wake Technical Community College Aug 2018 – Dec 2019**

**SCADA/PLC**

* PLC (Programmable Logic Controllers, industrial sensors)
	+ Traffic light controls, water filtration system based on analog and digital sensors and timers
	+ LogixPro, Compact Logix used on Allen-Bradley SLC 500

**North Carolina State University - Raleigh, NC Aug 2013 – May 2016**

**B.S., Computer Engineering**

* Digital logic design
* Electric Circuit Analysis (3yrs)
* Verilog (1.5yrs), C (2yrs), Java(1yr) [classroom time]
* ASIC and FPGA coding, Design, Simulation, Testing.
* Introduction to Computer Networking – packet analysis and protocols using Wireshark and Nmap
* Embedded systems car – project portfolio, troubleshooting, soldering, programming, documentation of design process
* Embedded RTOS alarm – reading various sensors and producing a priority list of responses
* Autonomous remote water sampling craft
* MATLAB – Signal filter analysis, design, and simulation, time domain and frequency domain conversion and calculations, differential equations
* Assembly - (1yr) full calculator program including powers, division, roots, floating point from scratch

**Central Carolina Community College – Sanford, NC Aug 2010 - May 2013**

A.S. Science - C++ programming, Calculus, Physics, Chemistry, Public Speaking

**Senior Design Project:** Autonomous remote water sampling craft **Aug 2015 - May 2016**

Designed and constructed a Wi-Fi capable autonomous craft prototype that periodically collected timestamped sensor data and read an onboard GPS receiver to navigate to specified coordinates. Upon reaching a target location, a pump would be operated along with a sequence of valves to collect water for further analysis at a lab.

**Embedded Systems**

 **ARM Cortex M (MSP430 32-bit, 2yrs) [C, C++, Node.JS]**

RTOS reading temperature, humidity, light, joystick, microphone and calculating values. When values became out of range for specific conditions, a message was indirectly sent through Twitter via Bluemix.

RTOS reading Twitter messages, parsing data to change an RGB LED to correct color or activate an alarm of varying sounds.

 **RISC 16-bit (MSP430, 3yrs) [C]**

Senior design project of an autonomous water sampling craft: Dissolved Oxygen sensor, follower opamp circuits, normally closed solenoids, GPS module, relay controlled motors, Wi-Fi module, pumps all controlled by location information to find locations and log data.

 Line-following robot: IR LED’s, photo sensors, timers, PWM used to follow an unknown “track” made of electrical tape. After one full lap it had to autonomously turn around and complete the track in reverse.

 Communication and parity checking: reading messages from a separate board, parsing data, write the message to LCD screen then pass the message to a third board. If data was incorrect, some code was added to attempt to correct the received message.

**Raspberry Pi (1yr) [C, C++, Python]**

Stepper motor control (microstepping), read keypad, NFC tags, send messages over Wi-Fi, python web scanning, ultrasonic range sensor, write to LCD, GitHub.

**ESP8266 (1/2yr) [Arduino]**

Temperature, humidity, barometric pressure sensors, sending data over Wi-Fi for data logging.

**PLC (0.5yrs)**

 **Allen-Bradley SLC 500**

Traffic light control, production line simulation of varying sensors and conditions, water filtration

**Verilog (1.5yrs)**

 **ModelSim, PSpice, Quartus**

Dijkstra's algorithm designed, simulated, and verified. Simple processor designed and simulated. Size of a processor based off of silicon size optimized. Strong emphasis on separation of control and data path. Exposure to graphical algorithm implementation.

**Python (1.5yrs)**

Regular expression searching, parsing strings, calculations, data represenation, reading small weather sensors and saving them for future viewing.

**MATLAB (1.5yrs)**

Signal filter analysis, design and simulation. Math scripting and visualization.

**Hobbies**

 Metal working, welding, amateur mechanic, automotive troubleshooting and rebuild, finding practical applications of hardware.